

WHAT IS CLAIMED IS:

1. A pretreatment method for element analysis of a metal sample, comprising removing contaminants on a surface of the metal sample by sputtering while at least one electrode for sputtering is cooled.

2. The pretreatment method according to claim 1, wherein the metal sample is at a side of a cathode and a plurality of anodes face the cathode, and at least one of the anodes is cooled for sputtering.

3. The pretreatment method according to claim 1, wherein the metal sample is at a side of an anode and a plurality of cathodes face the anode, and at least one of the cathodes is cooled for sputtering.

4. The pretreatment method according to claim 1, comprising analyzing an element in the metal sample selected from the group consisting of carbon, oxygen, nitrogen and sulfur.

5. The pretreatment method according to claim 2, comprising analyzing an element in the metal sample selected from the group consisting of carbon, oxygen, nitrogen and sulfur.

6. The pretreatment method according to claim 3, comprising analyzing an element in the metal sample selected from the group consisting of carbon, oxygen, nitrogen and sulfur.

7. The pretreatment method according to claim 1, wherein the element analysis of the metal sample is by fusion analysis or combustion analysis.

8. The pretreatment method according to claim 2, wherein the element analysis of the metal sample is by fusion analysis or combustion analysis.

9. The pretreatment method according to claim 3, wherein the element analysis of the metal sample is by fusion analysis or combustion analysis.

10. The pretreatment method according to claim 4, wherein the element analysis of the metal sample is by fusion analysis or combustion analysis.

11. The pretreatment method according to claim 5, wherein the element analysis of the metal sample is by fusion analysis or combustion analysis.

12. The pretreatment method according to claim 6, wherein the element analysis of the metal sample is by fusion analysis or combustion analysis.

13. A pretreatment apparatus for element analysis of a metal sample, comprising:  
a cathode for holding a metal sample;  
anodes arranged to counter the cathode for sputtering;  
a pretreatment chamber for storing the cathode, the anodes and the metal sample under an inert gas atmosphere; and  
a cooling device for cooling at least one of the anodes or the cathode.

14. The pretreatment apparatus according to claim 13, comprising a plurality of the anodes arranged to counter the cathode, and the cooling device cools at least one of the anodes.

15. A pretreatment apparatus for element analysis of a metal sample, comprising:  
an anode for holding a metal sample;  
cathodes arranged to counter the anode for sputtering;  
a pretreatment chamber for storing the anode, the cathodes and the metal sample under an inert gas atmosphere; and  
a cooling device for compulsively cooling at least one of the cathodes or the anode.

16. The pretreatment apparatus according to claim 15, comprising a plurality of the cathodes arranged to counter the anode, and the cooling device cools at least one of the cathodes.